LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

SPRING BAYOU

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Largemouth bass are managed to provide the opportunity to catch fish of greater average size. Other sportfish species are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish adequate to maintain angler interest.

Commercial

Utilization of the commercial fishery is limited at present. Spring Bayou was closed to commercial fishing in April 2009 as a measure to protect introduced triploid grass carp (TGC).

Species of special concern

No threatened or endangered species have been observed in Spring Bayou.

SPECIES EVALUATION

Recreational

Largemouth bass are targeted for evaluation since they are a species indicative of the overall fish population due to their high position in the food chain. Electrofishing is the best indicator of largemouth bass abundance and size distribution. Shoreline seining has been used in the past to collect information related to fish reproductive success and forage availability. Sunfish and crappie are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish.

Largemouth bass

Largemouth bass abundance and size distribution

Electrofishing sampling is conducted during night time hours. Shock time for each sample lasted approximately 900 seconds. The number of sample sites is determined by the total acres of a waterbody. Four electrofishing samples are conducted on Spring Bayou at locations representative of available habitat. The catch-per-unit-of-effort (CPUE) of largemouth bass collected from Spring Bayou by electrofishing from 1990 to 2011 is reported in Figure 1. CPUE has generally increased in all indicated size groups from 1990 – 1997. The decline in bass CPUE in 2000 - 2003 may be directly related to an abundance of submerged aquatic plants, especially hydrilla, which greatly limited sampling efforts. Largemouth bass CPUE began an upward trend in 2005, but a CPUE decline is noted in 2007- 2008 in all size groups (Figure 1). An expanded coverage of hydrilla is suspected as a significant influence to those results. As submerged vegetation declined, beginning in 2010, CPUE's increased as shown in Figure 1. The size distribution increased once the submerged vegetation was reduced as shown in Figure 2. Also shown in Figure 2 is an increase in young-of-the-year (YOY) bass and in the larger-sized inch groups collected during electrofishing samples.

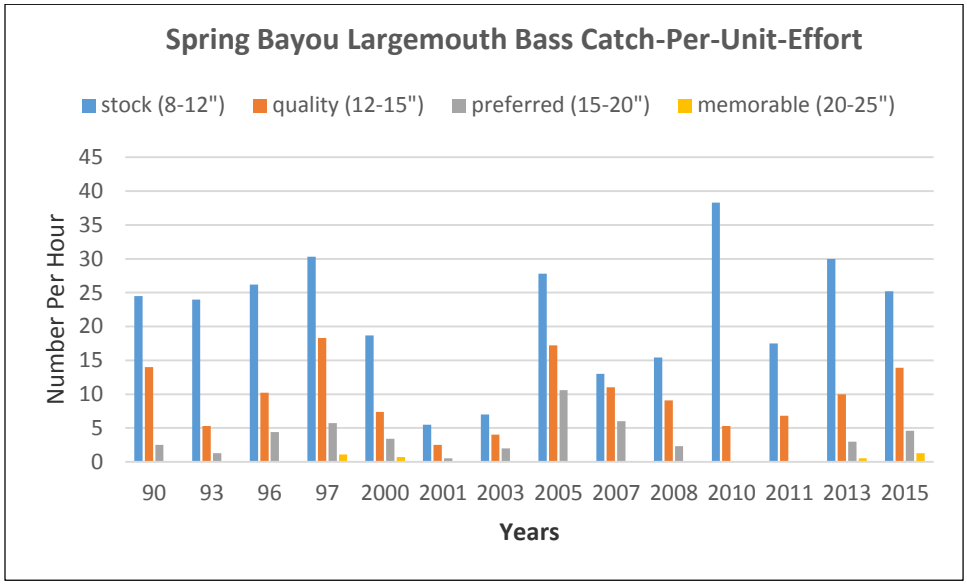

Figure 1. The spring catch-per-unit-of-effort (CPUE: number per hour) for largemouth bass of stock-, quality-, preferred-, and memorable-size fish sampled by electrofishing at Spring Bayou, LA, from years 1990 - 2015.

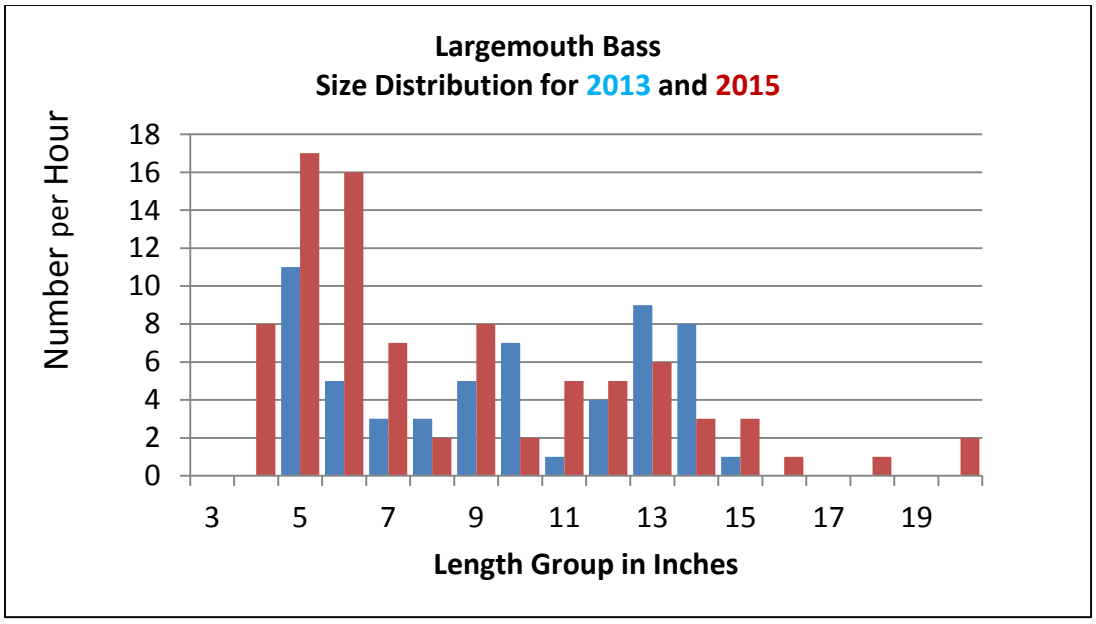

Figure 2. Largemouth bass size distribution (inch groups) from spring electrofishing samples (number sampled per hour) taken on Spring Bayou, Louisiana for 2013 N=57 and 2015. N=86.

Largemouth bass recruitment has been sporadic (Figure 3). Abundance of bass exceeding 13 inches in total length is low for all three years reported. Total number of bass collected each year was very similar; 2005 = 36, 2007 = 32 and 2008 = 34.

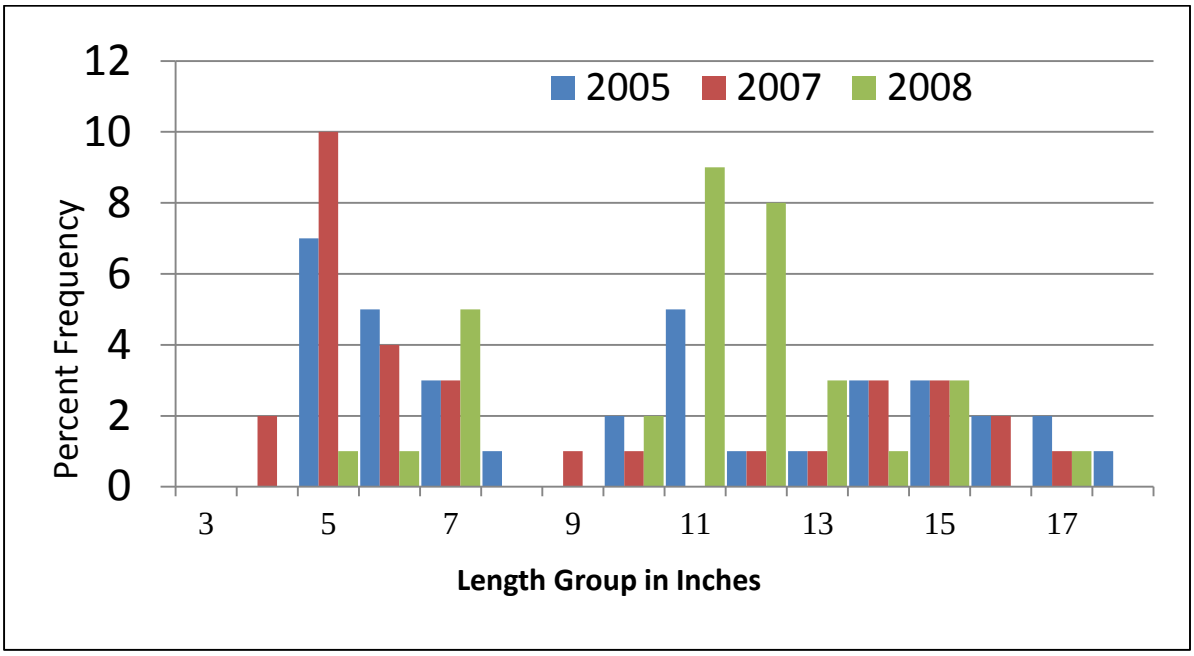

Figure 3. Largemouth bass size distribution (inch groups) from spring electrofishing samples taken on Spring Bayou, Louisiana for 2005, 2007, and 2008. N for 2005=36, N for 2007=32, N for 2008=34.

Largemouth bass recruitment has increased as shown in Figure 4. Abundance of bass exceeding 13 inches in total length has increased in 2013 and 2015 due to the decrease in aquatic vegetation allowing access.

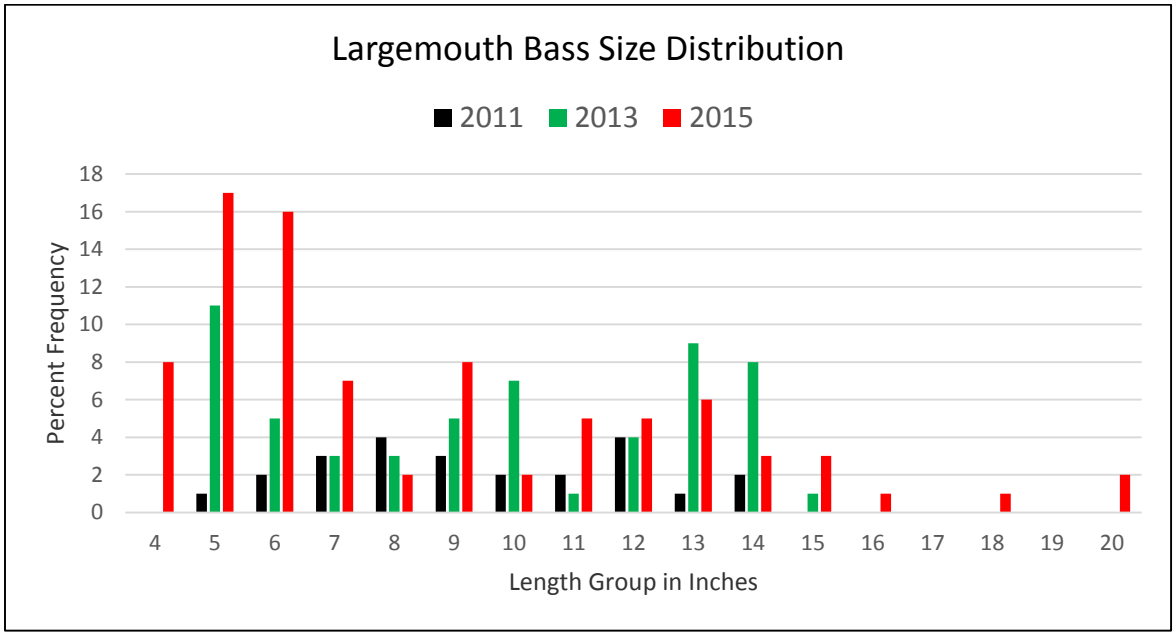

Figure 4. Largemouth bass size distribution (inch groups) from spring electrofishing samples taken on Spring Bayou, Louisiana for 2011, 2013 and 2015. N for 2011 = 24, N for 2013 = 57, N for 2015 = 86.

Largemouth bass genetics

The majority of largemouth bass collected for genome determination are taken during fall standardized electrofishing samples. Five bass per inch group are collected for growth and genetics analysis. Otoliths (ear bones) and liver tissue are removed. Total length and weight is recorded for each specimen. The Louisiana State University genetics laboratory conducts starch gel electrophoresis. Genetic results for the Spring Bayou largemouth bass population are presented in Table 1. Results from samples in 1995 and 2000 indicate that native (Northern) largemouth bass are dominant in Spring Bayou. Recent genetic sampling has not been conducted due to complications related to an overabundance of hydrilla.

Table 1. Largemouth bass stockings and genetic results for Spring Bayou, LA for 1995 and 2016.

YEAR	FLMB STOCKINGS	GENETIC SAMPLING RESULTS				
		N	NLMB	FLMB	Fx	TOTAL FLORIDA INFLUENCE
1993	68,657					
1995	0	45	93%	4%	3%	7%
1999	25,156					
2000	30,757	18	83%	11%	6%	17%
2001	25,000					
2002	24,390					
2003	25,270					
2008	27,027					

2009	27,508					
2010	89,306					
2011	20,812					
2012	16,953					
2014	43,132 *575,400					
2016	27,308					
TOTAL	1,026,676					
*Sac Fry						

Largemouth bass relative weight

Sunfish and shad (gizzard and threadfin) have been identified as primary bass forage species in Spring Bayou. During the fall sampling period, a 450 second electrofishing sample is conducted to determine forage relative abundance. Shoreline seine sampling is also conducted each summer to determine young-of-the-year production. There is a difference between forage abundance and availability. If there is an overabundance of aquatic vegetation, visual barriers created by the vegetation preclude effective feeding by predators.

Largemouth bass body conditions are analyzed to determine effective utilization/conversion of available forage. Relative weight (Wr) is a measure of fish "plumpness" and is the ratio of fish weight to that of a determined standard. The Wr is calculated by dividing the weight of individual fish by the standard weight for fish of the same length, and multiplying the quotient by 100. Largemouth bass relative weights below 80 may indicate a potential problem with forage availability. Spring Bayou largemouth bass average a Wr near 96 in all size groups, indicating a healthy bass population with abundant and available forage.

Table 2. The percent of fish, by species, that are ≤ six inches in total length from forage electrofishing samples from 2000 – 2015 in Spring Bayou, Louisiana.

Forage – Electrofishing Samples (% of sample)								
Year	Bluegill	Redear Sunfish	Longear Sunfish	Silversides	Gizzard Shad	Threadfin Shad	Warmouth	Lake Chub Sucker
2000	10.3	2.6	0	0	2.6	51.3	0	0
2001	0	0	0	0	0	0	0	0
2005	30.3	0	4.7	7.0	0	0	4.6	0
2007	37.0	0	0	0	0	0	3.7	0
2008	54.6	0	0	0	0	0	0	0
2010	74.9	3.7	0	0	0	0	3.7	0
2011	50.1	17.5	0	1.2	0	0	1.2	0
2013	47.8	4.8	0	1.8	4.1	5.9	3.0	4.8
2015	39.6	4.2	0	3.3	0.4	32.2	1.3	3.3

Bluegill comprised the highest percentage of available forage from 2000 – 2013, except in 2000 when shad was the number one available forage (Table 2). Shad was not present in the following year's sample which could be attributed to sample bias due to an infestation of

submerged vegetation and periodic fish kills. In 2015, shad were present in the sample which will benefit largemouth bass relative weights.

Shoreline seine sampling is conducted in the summer months of June – August. All samples were conducted at night from one-half hour after sunset until one –half hour before sunrise. A one quadrant haul sample was taken at each station using a 25-foot-long seine, six feet deep, fitted centrally with a 6' x 6' x 6' bag and consisting of 3/16-inch Ace® nylon mesh. A total of three seine hauls were taken each year at the three boat ramps, one haul per ramp. The quadrant haul was conducted by anchoring one end of the seine at the shoreline and the other stretched perpendicular to the shoreline. The distal end was then swung around back to the shoreline, keeping the lead line tight and on the bottom. After the seine haul is completed, all fish are removed from the seine and placed into a properly marked plastic bag, which is then placed on ice. In the laboratory, fish specimens are sorted by species, enumerated, and total lengths measured in inch groups by total number. Species collected in Spring Bayou consisted of sunfish, largemouth bass, shad, silversides and golden shiners. Bluegills were the predominant forage species collected in seine hauls (Table 3).

Table 3. Total numbers of all fish species $\leq$ 6 inches in total length captured by seine hauls from Spring Bayou, LA, 1990 – 2010.

Total Number By Species								
Year	Bluegill	Other sunfish	Silversides	Golden Shiners	Gizzard Shad	Threadfin Shad	Mosquito Fish	Yellow Bass
1990	144	108	355	0	87	162	279	90
1991	280	170	969	30	22	16	1467	172
1993	690	157	1444	46	77	218	527	30
1994	359	139	695	79	1	98	84	36
1995	415	168	328	21	74	232	96	39
1996	622	424	690	42	133	717	134	39
1998	110	51	0	30	175	4	84	102
2003	184	103	502	25	45	19	141	0
2007	12	0	4	0	0	0	261	0

Forage was comprised mainly of gizzard and threadfin shad, 6 inches TL or less during the 1980's. An average of three 1-acre biomass (rotenone) samples/year is shown in Figure 5 below. Rotenone sampling typically used to monitor forage populations has been limited due to the excessive amount of aquatic vegetation (hydrilla) in the lake. The infestations block out suitable areas in which to place the block-off net. Increasing hydrilla infestations, in the most recent year of sampling (2007), reduced the biomass (pounds/acre) of available forage by more than 50% to the lowest level recorded.

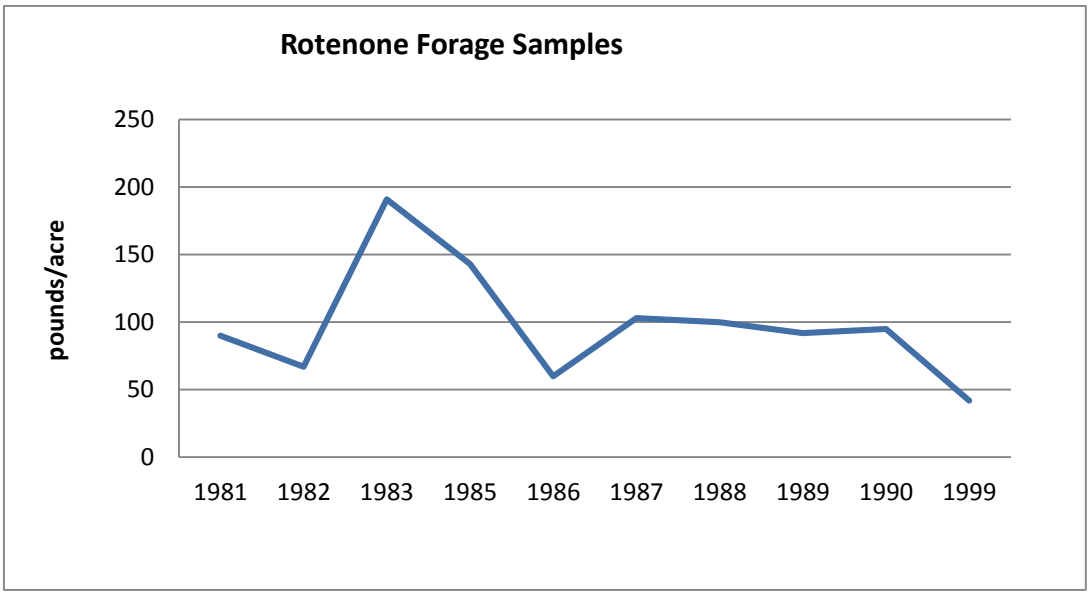

Figure 5. Forage samples (≤ 6 inches TL) from standardized biomass (rotenone) samples taken in Spring Bayou, Louisiana from 1981-1999.

Crappie

Abundance and size distribution-

LDWF crappie CPUE remained low from 2000 – 2003, then increased in 2005 (Figure 6). From 2000 – 2003, numbers were extremely low which can be related to the drought of 1999/2000 causing low water levels and related fish kills. Increased predation is also likely. In 2005, abundance increased in all size groups which could be related to a high recruitment rate and immigration of fish from other areas. In 2008, results indicating reduced abundance are likely biased due to excessive submerged vegetation. In 2010, 2011, 2013 and 2015, sampling results showed a substantial increase in quality- and preferred-size classes of crappie, perhaps due to reduced aquatic vegetation and increased forage availability throughout the lake.

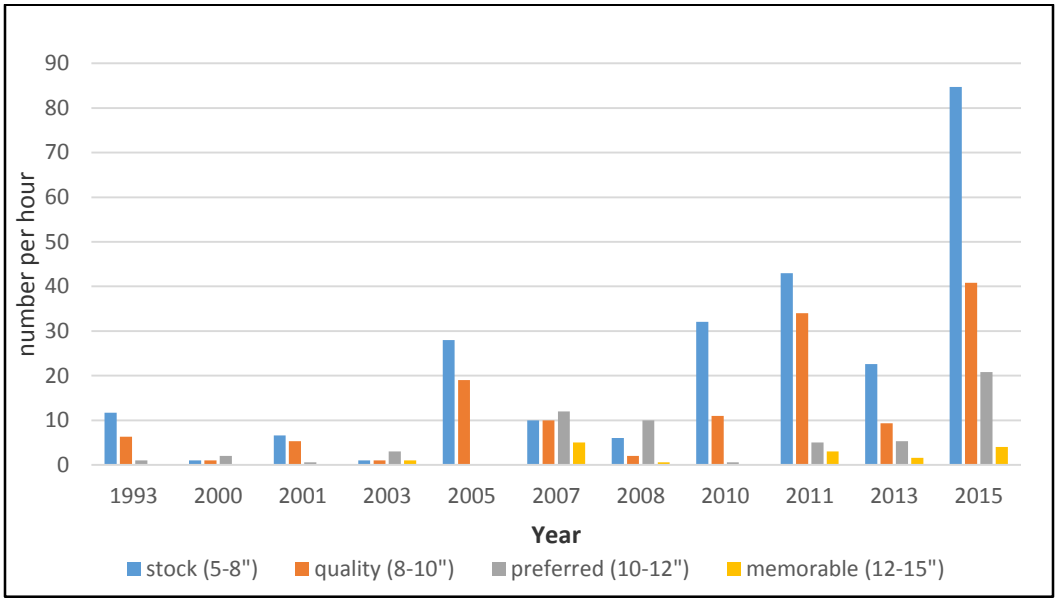

Figure 6. Crappie relative abundance by size group (CPUE: fish per hour) from fall electrofishing at Spring Bayou, LA, for the years 1990 - 2015.

The size distribution of crappies collected in Spring Bayou using lead nets during 2012 is shown in Figure 7. Total catch is sorted by inch groups to provide a size distribution model of the population at the time of sampling. The fall 2012 length distribution of the crappie population ranged from 2-16 inches with strong representation of the 7-12 inch groups. The majority of the crappies captured consist of black crappie. The total number of crappie collected was 465 taken in four different sample locations. The total soak (fishing) time of the lead nets was approximately 48 hours. The increase in total number of crappie captured may have been related to the 2011 Mississippi River flood, which inundated the complex thereby improving crappie recruitment and forage availability. The 2012 season marked the first time lead net samples were taken in Spring Bayou. The fall of 2016 marked the first year of a three-year population assessment project for crappie on Spring Bayou. Numbers of crappie appeared to increase substantially over past years of sampling due to reduced submersed aquatic vegetation, therefore improving crappie recruitment. Because lead nets are very efficient at capturing crappies, future samples will also be taken utilizing this gear to assess populations (Figure 8).

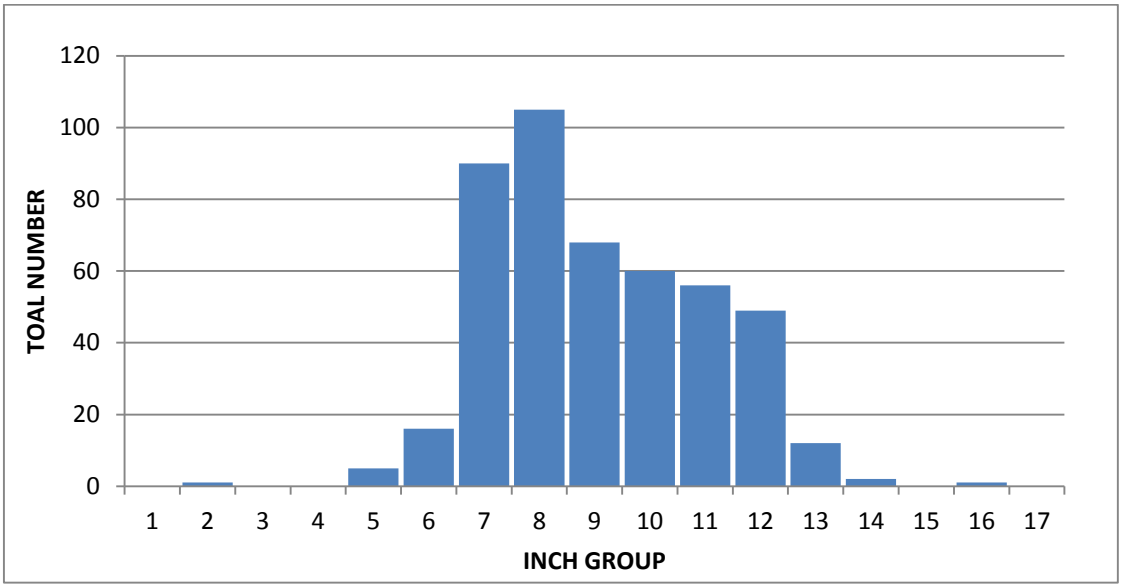

Figure 7. The size distribution (inch groups) of crappie captured in lead net samples at Spring Bayou, Louisiana in the fall of 2012. N=465.

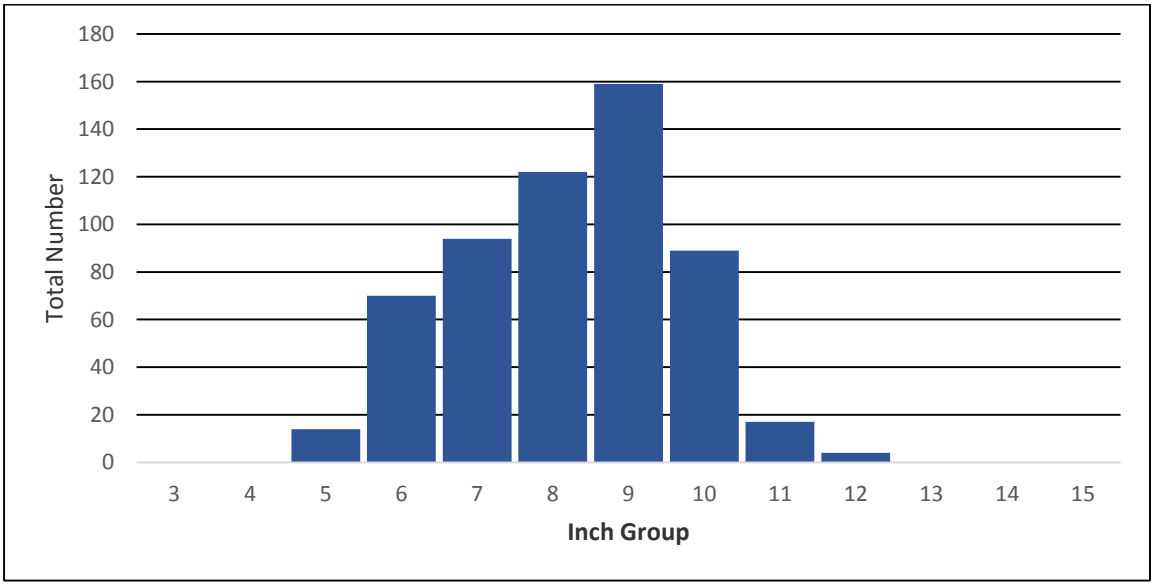

Figure 8. The size distribution (inch groups) of crappie captured in lead net samples at Spring Bayou, Louisiana in the fall of 2016. N= 565.

Commercial

Commercial fishing is permitted Monday through Friday on Spring Bayou except slat traps and hoop nets may be fished any day of the week. However, the use of gill nets and trammel nets or the take of or possession of grass carp was prohibited in January of 2009 (Appendix I). The webbing prohibition was implemented to protect TGC, introduced for hydrilla control. Permits are issued by the LDWF area supervisor or from the LDWF office in Opelousas to harvest commercial fish species on Grassy Lake WMA, Pomme De Terre WMA, and Spring

Bayou WMA (Appendix II). No commercial fishing activity is allowed before 2:00 PM during the migratory waterfowl season. Commercial fish landings have been reduced by approximately 90% of past levels due to the increase in hydrilla coverage and the entanglement gear prohibition (Figure 9).

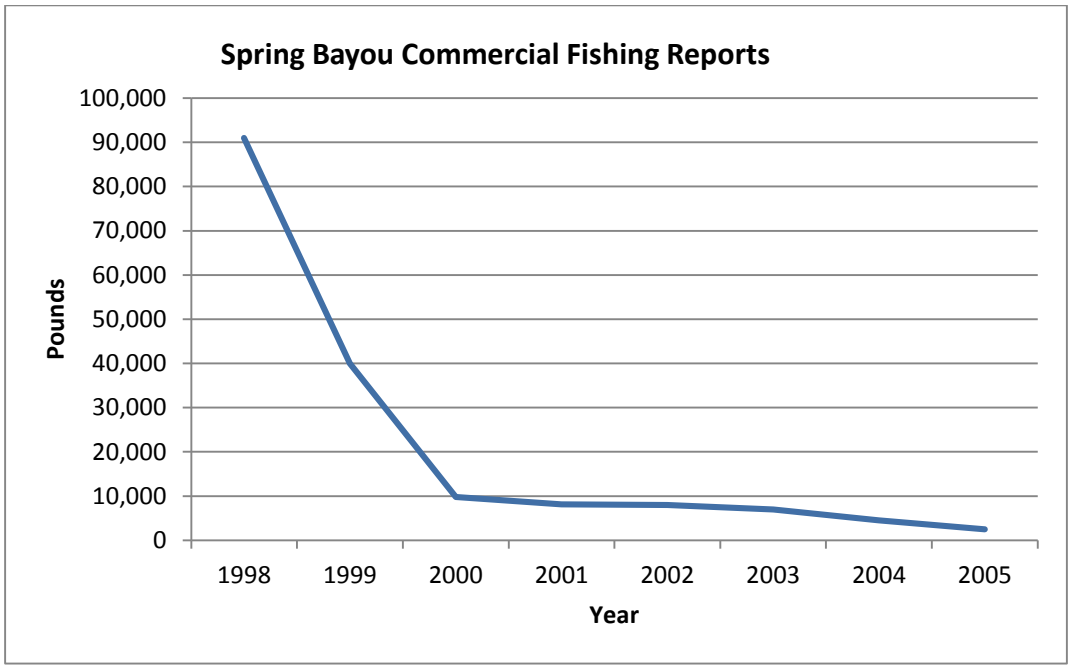

Figure 9. Commercial fish landings in total pounds compiled from annual commercial fish landing reports for Spring Bayou, LA from 1998 – 2005. Commercial species such as common carp, buffalo, bowfin and freshwater drum accounted for most species captured.

LDWF standardized sampling includes monofilament gill nets of 2.5 inches, 3.0 inches, 3.5 inches and 4.0 inches set between December 1 and February 28. The minimum number of net sets is determined by the surface area of the impoundment. A net set consists of four, 100 yard nets of the specified mesh sizes. Gill nets are set within one hour of sunset and retrieved as soon as possible after sunrise the following morning. All fish captured are individually measured for total length (millimeters) and weight (grams).

The most common species sampled in 2011 were buffalo and bowfin. Other species noted were the triploid grass carp (TGC), which were stocked in Spring Bayou in 2008 to 2015 to control the spread of hydrilla (Table 4).

This backwater system is influenced by Red River spring floods. Commercial fish species enter the complex and increase their population. As shown in Table 4 in 1997, 2011 and 2015 high water events resulted in increased abundance of commercial species.

Table 4. Total number of species captured per year with monofilament gill nets fished on Spring Bayou, LA during 1990 – 2015.

Species	1990	1991	1992	1993	1994	1995	1997	2002	2011	2013	2015
LMB			15	3	8	17			1	17	16
White Crappie	1	13	7	2	3	15				3	0
Black Crappie		7	2	1	1	17	2	4	1	6	2
Common Carp			19	8	20	19	29	3	4	5	1
Channel Catfish			2	1	4	1	2	1		5	0
Blue Catfish	1			2	3	17		1	1	1	0
Bullhead					3	2	2	3	7	16	17
Bigmouth Buffalo			42	31	76	92	267	19	178	112	94
Smallmouth buffalo			10	8	18	15	67		32	91	114
Freshwater Drum			7	13	5	6	9			1	2
White Bass		5		2			2			0	0
Bowfin		44	31	32	34	93	25	3	43	59	26
Spotted Gar				3		6	6			2	1
Alligator Gar										4	0
Gizzard Shad			9	7	5		21	2	3	1	3
Flathead Catfish					1					0	0
Grass Carp									66	8	75
Silver Carp									5	14	1

Creel Surveys

Access point creel surveys are conducted on water bodies to collect fishery dependent data from anglers including: fishing pressure, catch rates, harvest, size structure of harvested fishes, angling success and species preference.

Table 5. Average number of largemouth bass anglers interviewed, time fished and distance traveled to Spring Bayou, LA during the 1989, 1992 and 2009 creel surveys.

BASS ANGLERS State regulations – no minimum/10 fish creel			
Year	Mean no. of anglers in party	Mean trip length (hours)	Mean one-way distance traveled to ramp
1989	1.6	4.04	14 miles
1992	1.72	3.73	11 miles
2009	1.92	2.49	15 miles

Bass anglers on Spring Bayou averaged four hours per trip fishing after having driven approximately 15 miles to the ramp where they launched their boat in the 1989 survey. In 1992, average trip length fell to 3.73, but the creel survey was cut short when Hurricane Andrew hit the Atchafalaya Basin causing major fish kills. Fishing effort was extremely low during the remainder of 1992 following the hurricane. In the 2009 creel survey, average trip length fell to 2.49 hours. Fish kills caused by Hurricane Gustav in 2008 contributed to reduced angler catch as well. Participation by local largemouth bass anglers (Avoyelles and Rapides Parishes) made up the majority of fishermen interviewed.

Tables 6, 7, and 8 below report the number of largemouth bass caught, released and harvested per trip by month during the 1989, 1992 and 2009 surveys. Catch rates were found to be the highest in the month of July in 1989. Number of bass harvested (431) is just above the number of bass released (429). In the 1992 survey, catch rates were highest in June and July with the average weight of bass to near 1.66 pounds. From August – December, no creel surveys (NC) were conducted due to Hurricane Andrew and related fish kills.

The average weight of a largemouth bass caught in the 1989 creel survey was 1.62 pounds. In the 2009 creel survey, angler catch was much reduced; likely due to excessive hydrilla growth and Hurricane Gustav-induced fish kills.

Tables 6, 7, and 8. Largemouth bass caught, released and harvested per trip by anglers on Spring Bayou, LA, during the 1989, 1992 and 2009 creel surveys. NC = no creel conducted. Minimum length limit = MLL.

Table 6.

State regulations – no MLL/10 fish creel (1989 Creel Survey)				
Month	LMB caught / trip	LMB released / trip	LMB harvested / trip	Ave. weight
1	1.45	0.86	0.59	1.31
2	0.91	0.76	0.14	1.82
3	1.04	0.64	0.40	1.60
4	1.90	1.5	0.34	1.88
5	0.88	0.38	0.50	1.56
6	1.61	1.17	0.44	1.24
7	5.59	3.07	2.51	1.09
8	2.58	0.88	1.70	1.49
9	2.63	1.50	1.13	1.18
10	2.95	0.90	2.05	1.39
11	3.11	1.19	1.92	1.16
12	0.55	0	0.50	3.75

Table 7.

State regulations – no MLL/10 fish creel (1992 Creel Survey)				
Month	LMB caught / trip	LMB released / trip	LMB harvested / trip	Ave. weight
1	0	0	0	0
2	1.41	1.18	0.22	1.82
3	0.67	0.27	0.44	1.60
4	0.74	0.17	0.56	1.88
5	2.51	1.59	0.92	1.71
6	2.82	1.66	1.16	1.40
7	2.89	1.88	1.01	1.58
8	NC	NC	NC	NC
9	NC	NC	NC	NC
10	NC	NC	NC	NC
11	NC	NC	NC	NC
12	NC	NC	NC	NC

Table 8.

State regulations – no MLL/10 fish creel (2009 Creel Survey)				
Month	LMB caught / trip	LMB released / trip	LMB harvested / trip	Ave. weight
1	0	0	0	0
2	0.42	0.38	0.11	1.71
3	0.14	0	0	0
4	0	0	0	0
5	0	0	0	0
6	NC	NC	NC	NC
7	NC	NC	NC	NC
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0

Although largemouth bass and crappie only averaged 19% and 16%, respectively, of total fish harvested for Spring Bayou, these two species are most pursued by Spring Bayou fishermen. During 1989, bluegill was the most abundant species harvested (61%) by anglers (Figure 10) throughout the creel year.

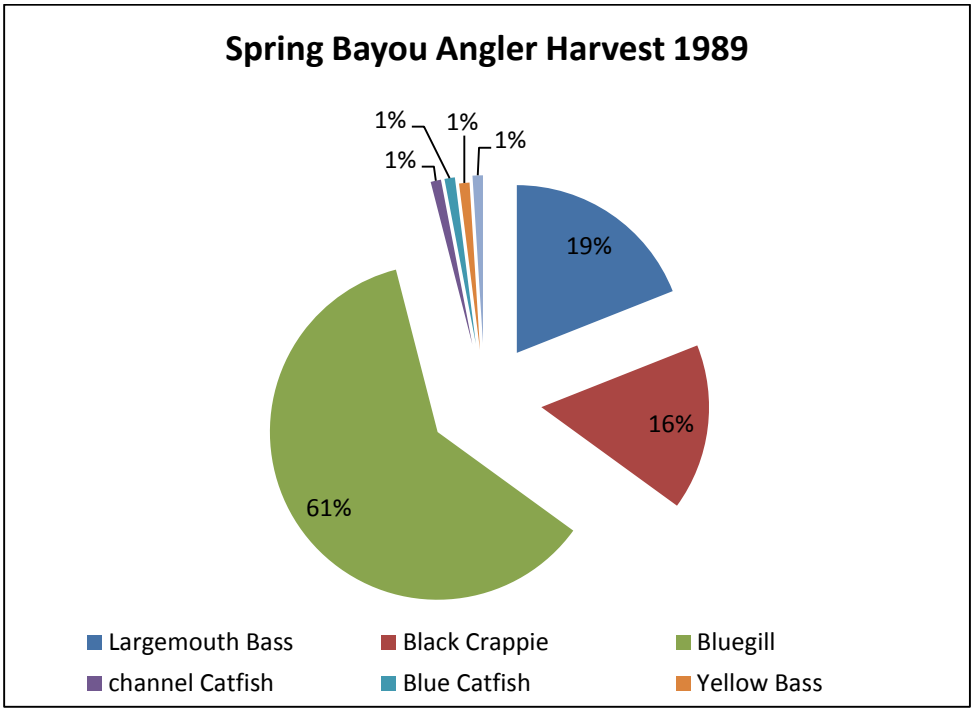

Figure 10. The percentage (%) by number of total fish species harvested by anglers from Spring Bayou, LA during the 1989 creel survey.

Bluegill was the most abundant species (45%) harvested during the 1992 creel survey as shown in Figure 11 below. This was followed by black crappie (19%), largemouth bass (17%) and warmouth at 12%.

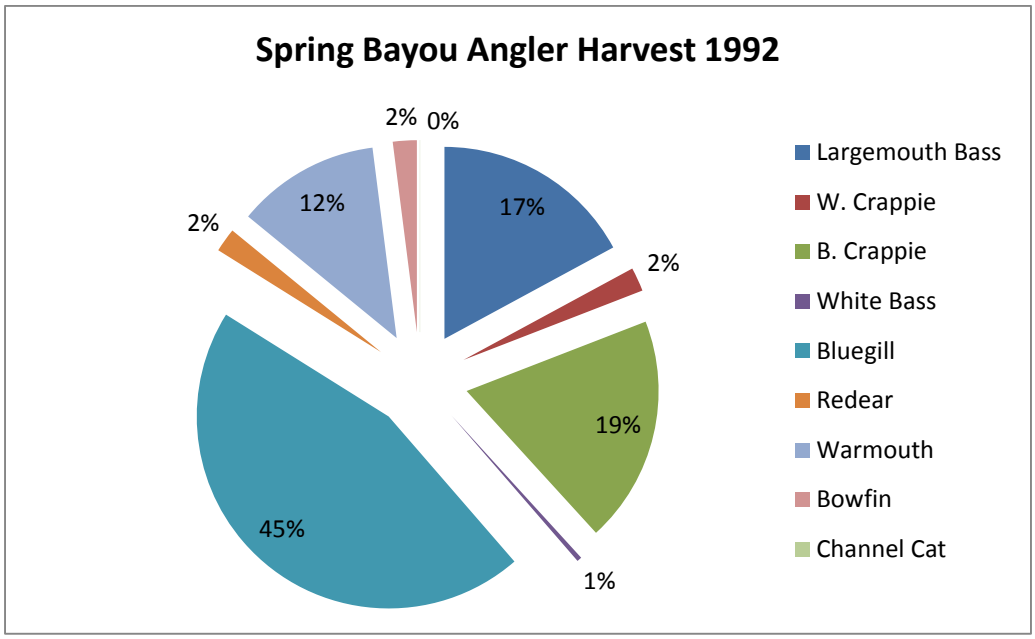

Figure 11. The percentage (%) by number of total fish species harvested by anglers from Spring Bayou, LA during the 1992 creel survey.

Few largemouth bass were harvested (1%) by anglers in the 2009 creel survey (Figure 12). Bluegill (54%) and black crappie (25%) were the two most abundant species. In lesser numbers harvested were redear sunfish (9%), warmouth (8%), followed by white crappie at 2%.

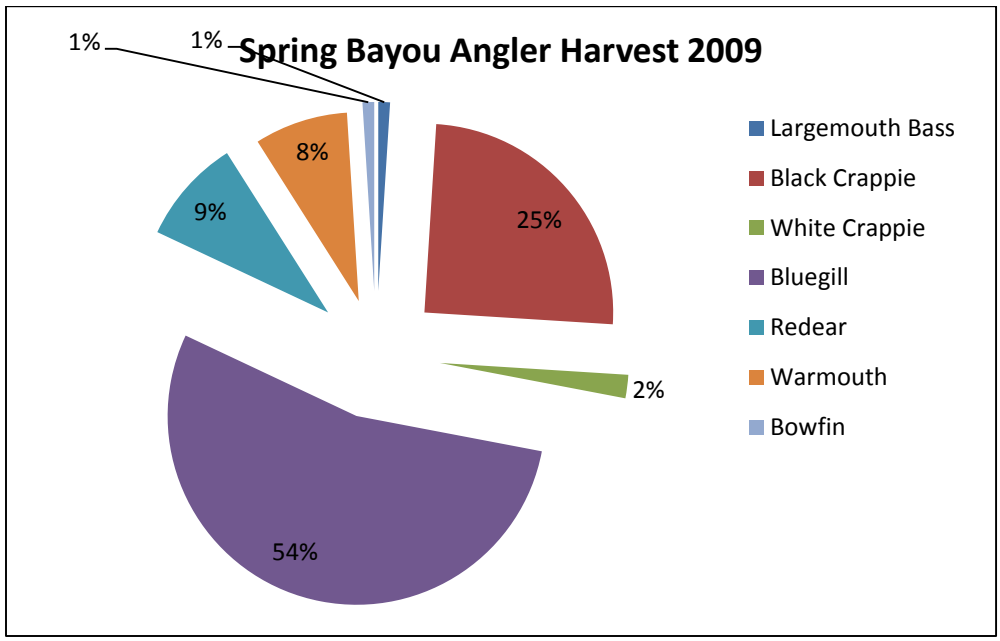

Figure 12. The percentage (%) by number of total fish species harvested by anglers from Spring Bayou, LA. during the 2009 creel survey.

During Spring Bayou creel survey interviews in 2009, anglers were asked their opinion of current bass regulations. If the angler expressed disagreement with the regulation, they were asked to provide suggestions for change.

Table 9 below shows the results of those opinion questions. These results were compiled from largemouth bass anglers only. Highest percentage of approval (70%) was expressed for current regulations. Anglers who did not primarily pursue bass also responded with high approval of the current regulations. The majority of fishermen agreed with current largemouth bass regulations. During the 1989 and 1992 creel survey, an angler opinion survey was not conducted.

Table 9. Results of an angler opinion survey taken at boat ramp access points on Spring Bayou, LA during the 2009 creel survey.

Angler Opinion Survey Results		
Preference	Bass Anglers	All Anglers
	2009 n = 23	2009 n = 101
No length restriction	71%	91%
14” minimum	10%	0
12” minimum	14%	2%
No opinion	0	5%
14-17 slot limit	0	1%
Other Slot	2%	0
Other regulation	0	0
Other minimum	3%	1%

Sunfish species made up the greatest percentage of fish harvested in Spring Bayou during 1989, 1992 and 2009 (Table 10). Bluegill were most common, followed by warmouth and redear sunfish.

Table 10. Percent by number of common sunfish species harvested by anglers on Spring Bayou, LA, during the 1989, 1992 and 2009 creel surveys.

Year	**Bluegill**	**Redear Sunfish**	**Warmouth**	**Longear sunfish**
1989	99%	0.002%	0.002%	0.001%
1992	76%	3%	20%	1%
2009	76%	12%	12%	0

Crappies were harvested in the majority of the months during the 1989 creel survey (Figure 13). In the 1992 survey, crappie harvest was highest in February, followed by May and June. From August – December, no creel surveys were conducted on Spring Bayou due to Hurricane Andrew. District personnel were assisting with assessing the fish kills within the Atchafalaya Basin and continued to monitor fish populations for that year. In the 2009 survey, crappies were caught in the later part of the year especially during the August – October timeframe. Crappie numbers may have shown an increase in the 2009 survey, but due to personnel assisting another district with fisheries activities, the months of June and July were not surveyed. In later months of the creel survey, crappie harvest was minimal.

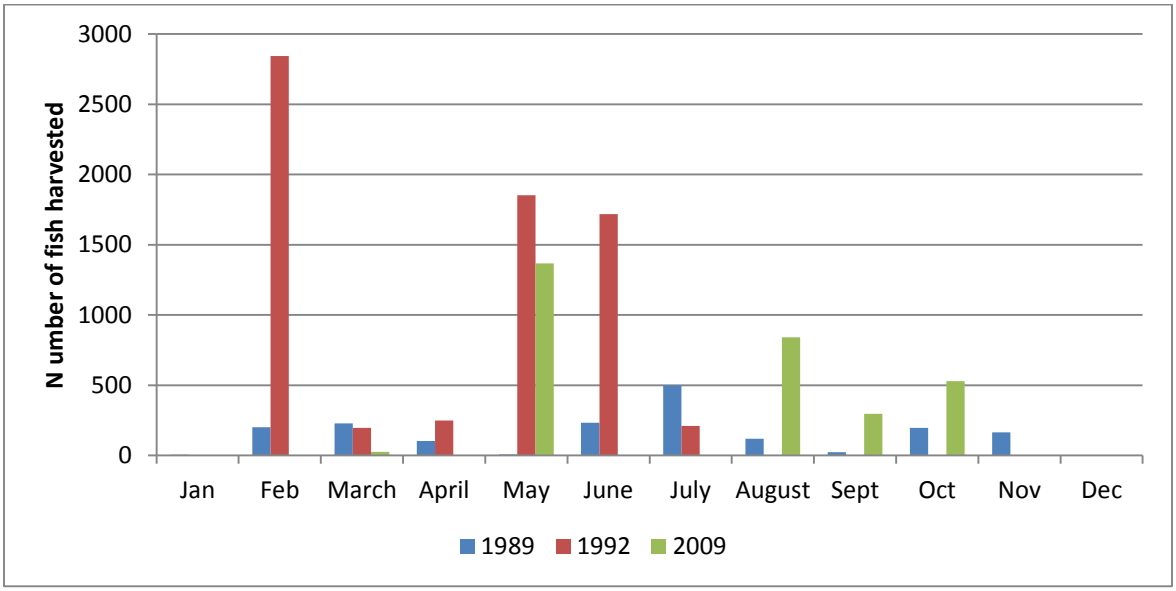

Figure 13. The total estimated number of crappies harvested by month and year by anglers on Spring Bayou, LA, during the 1989, 1992 and 2009 creel surveys.

Water Quality

Water quality parameters such as dissolved oxygen, temperature, pH, conductivity and depths were measured concurrent with other standardized sampling efforts, drawdown events and monthly site visits. As shown in Figure 14 below, dissolved oxygen (DO) levels often fell below 2.0 mg/l on the lake bottom from 2005 – 2012. This is due to excessive amounts of submerged vegetation such as hydrilla. In 2005 and 2008, surface and bottom readings fell below 2.0 mg/l due to the effects of Hurricanes Rita and Gustav. In 2011, dissolved oxygen levels fell well below 2.0 mg/l when Mississippi River floodwaters placed an additional 4 feet of water in Spring Bayou. Hypoxic conditions and fish kills occurred. In 2015, monthly water quality parameters were taken at 3 locations in the lake; one near the spillway, one at mid- lake and the other at the upper end of the lake (Tables 11 & 12). Readings were taken a 1 meter intervals beginning just below the surface to just above the bottom in areas which represent the deeper parts of the lake. Water quality parameters include turbidity (NTU), water temperature (C*), Dissolved oxygen (ppm), conductivity (u mhos/cm), pH (in tenths), depth (meters), lake level and secchi depth (cm). In Figures 15 and 16 the average temperature and dissolved oxygen readings (surface) of the three stations show low DO's in January and February which may be related to stratification but the other months have above average

readings. The bottom readings fell below 2 ppm when water temperatures rose above 17 * Celsius.

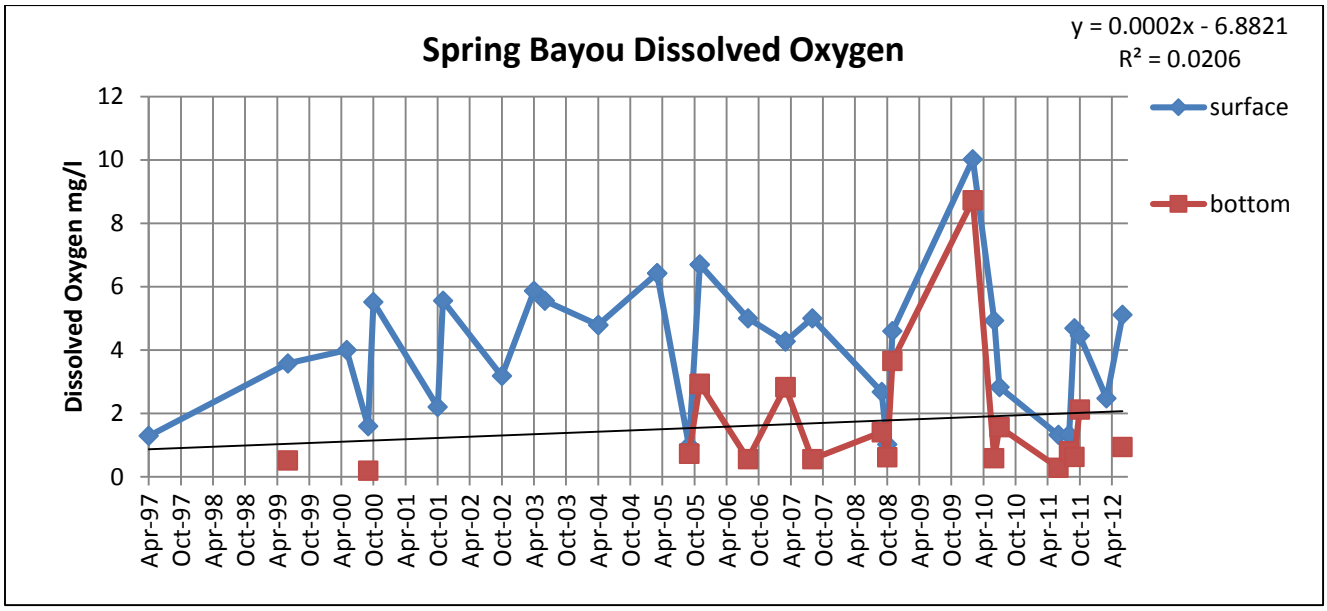

Figure 14. Dissolved oxygen measurements taken during standardized fisheries and random sampling events from Spring Bayou, Louisiana, during the years 1997-2012.

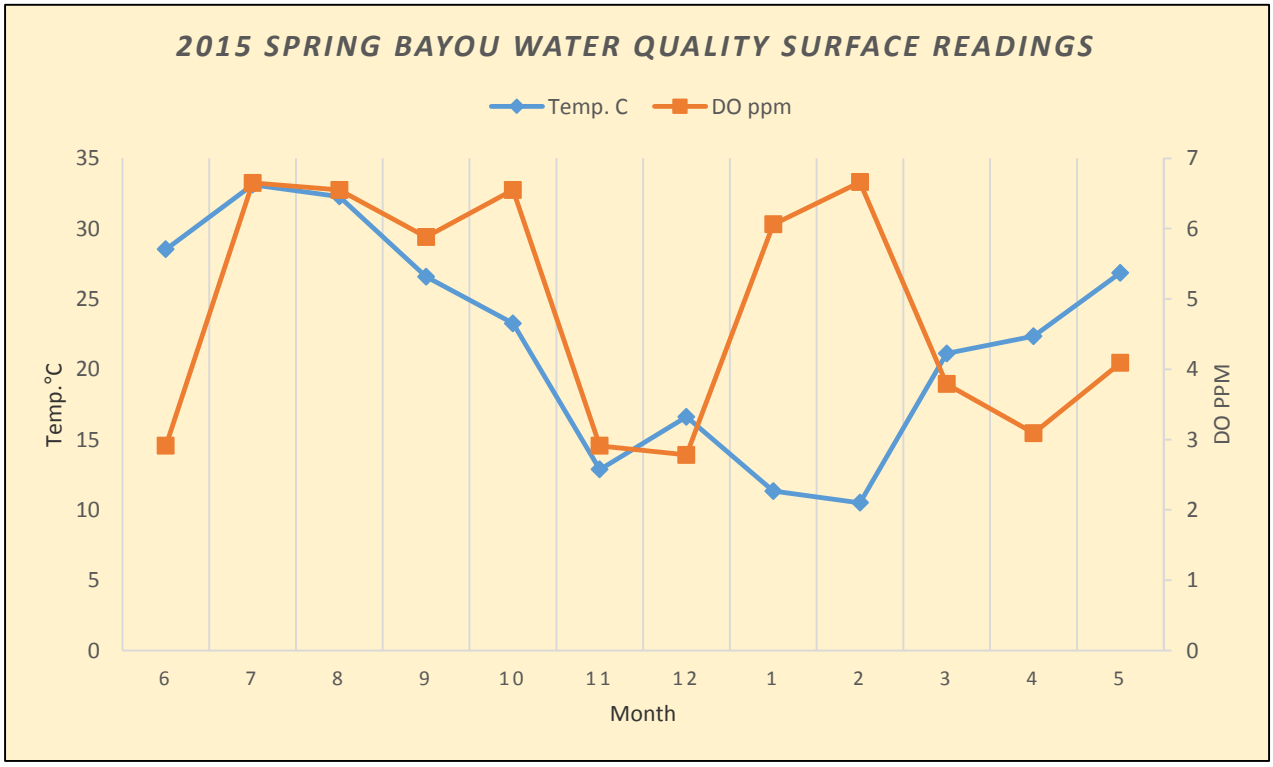

Figure 15. Surface temperature and dissolved oxygen readings by month for Spring Bayou during 2015.

Table 11. Actual water quality readings taken by station by month by parameter for Spring Bayou during 2015.

Spring Bayou Water Quality 2015

Jan. 11, 2015	Depth (m)	Temp. °C	D.O. ppm	PH	Turb. NTU	Conduct.
Station 1	0.194	11	5.6	9.5	47.6	0.071
Little River Bridge	1.191	11	5.7	9.65	49.7	0.071
	2.068	10.97	5.24	10.65	54.1	0.071
Station 2	0.102	11.86	7.03	8.61	14.4	0.079
Grand Bay	0.869	10.8	4.49	8.66	14.5	0.079
	1.854	10.56	1.02	8.91	14.8	0.078
Station 3	0.127	11.13	5.55	8.51	58.1	0.08
Tete de Bouef	1.899	10.58	5.61	8.57	46.4	0.078
	2.997	10.5	6.23	8.58	45.7	0.078
Feb. 18, 2015						
Station 1	0.161	10.41	7.6	9.23	20.6	0.086
	0.95	10.37	7.69	9.25	20.6	0.086
	1.98	10.15	7.88	9.48	40.6	0.086
Station 2	0.39	10.76	5.58	8.69	11.1	0.084
	1.47	10.14	4.78	8.83	22	0.084
Station 3	0.18	10.34	6.81	8.27	22.4	0.092
	2.38	9.53	5.92	8.29	40.5	0.092
	3.26	9.51	2.55	8.49	40.9	0.092
Mar. 18, 2015						
Station 1	0.123	20.4	2.98	8.47	29.3	0.08
	0.878	20.36	2.96	8.54	31.2	0.08
	1.88	20.36	3.04	8.7	32.2	0.08
Station 2	0.107	21.93	5.37	7.78	21.9	0.075
	0.893	20.97	2.3	7.85	36.1	0.082
	1.89	15.47	0.87	8.02	40	0.075
Station 3	0.209	21.03	3.03	7.34	42.2	0.095
	2.32	17.54	0.64	7.41	40.2	0.082
	3.39	15.36	0.84	7.4	40.2	0.086
Apr. 15, 2015						
Station 1	0.031	21.7	2.88	7.09	75.7	0.092
	0.92	21.47	2.91	7.08	78.2	0.092
	1.958	21.42	2.88	6.69	87	0.092
Station 2	0.024	22.75	3.37	6.75	12.3	0.089
	0.747	22.4	2	6.6	11.5	0.09
	1.679	21.9	0.7	6.27	10.6	0.09
Station 3	0.046	22.6	3.03	6.71	12.3	0.098
	1.885	21.98	2.05	6.66	12.6	0.096
	2.824	21.89	1.65	6.14	12.1	0.096
May 20, 2015						
Station 1	0.07	26.13	2.59	7.5	35	0.096
	0.867	25.95	2.38	7.66	36.5	0.096
	1.632	25.84	2.32	8.01	37.3	0.096
Station 2	0.022	27.37	5.23	6.91	9.4	0.082
	0.418	26.09	2.53	6.88	12.7	0.083
	1.534	24.23	0.56	7.18	12.2	0.088
Station 3	0.099	27.04	4.45	6.95	8.8	0.093
	1.369	25.63	1.74	6.62	11.8	0.102
	2.427	24.86	0.91	6.75	11.1	0.096
June 16, 2015						
Station 1	0.077	29.17	3.72	8.02	19.1	0.094
	0.87	28.5	2.59	8.19	19.1	0.094
	1.67	28.33	2.43	8.3	18.8	0.094
Station 2	0.043	27.9	2.94	7.3	6.8	0.088
	0.622	27.8	2.76	7.31	7.2	0.088
	1.25	27.5	2.36	7.43	7.7	0.088
Station 3	0.088	28.49	2.07	6.84	12.1	0.096
	1.25	28.05	1.26	6.78	12.2	0.096
	2.86	26.65	0.57	6.86	12	0.102

July 15, 2015	Depth (m)	Temp. °C	D.O. ppm	PH	Turb. NTU	Conduct.
Station 1	0.094	32.4	4.99	8.18	12.1	0.112
	0.796	31.77	3.56	8.35	13.3	0.112
	1.787	31.75	2.74	8.56	17.1	0.112
Station 2	0.032	33.42	9.19	7.86	15.5	0.09
	0.494	32.2	5.57	7.87	13.9	0.09
	1.045	31.87	3.6	8.04	13.7	0.091
Station 3	0.054	33.54	5.78	7.34	12.7	0.139
	1.283	31.78	3.38	7.3	14.8	0.146
	2.323	31.14	1.68	7.35	17.2	0.149
Aug. 13, 2015						
Station 1	0.59	31.17	2.78	8	14	0.188
	0.74	31.01	2.06	8.2	14	0.119
	1.56	30.8	0.84	8.6	15.8	0.139
Station 2	0.058	32.85	8.86	7.89	14.6	0.097
	0.56	32.02	3.55	7.92	13	0.099
	0.997	31.85	2.31	7.98	13.5	0.099
Station 3	0.131	32.84	8.01	7.28	16.2	0.152
	1.33	31.63	3.01	7.25	15.1	0.155
	2.59	31.37	1.53	7.52	14.9	0.158
Sept. 16, 2015						
Station 1	0.11	26.38	5.37	7.85	17.3	0.108
	0.769	25.89	4.14	7.95	26.1	0.108
	1.55	25.83	4.02	7.97	33.3	0.108
Station 2	0.206	26.78	6.94	8.41	19.1	0.101
	0.976	26.19	4.78	8.59	22.5	0.102
Station 3	0.099	26.6	5.35	8.13	14.9	0.144
	1.033	26.05	3.51	8.16	14.9	0.143
	2.085	25.95	2.73	8.23	21.5	0.145
Oct. 15, 2015						
Station 1	0.097	22.13	6.84	9.18	21.4	0.098
	1.128	21.91	5.94	9.45	24.1	0.098
Station 2	0.095	23.98	7.69	8.57	20.6	0.104
	0.71	22.99	5.8	8.77	23.4	0.104
Station 3	0.076	23.68	5.13	7.96	17.3	0.315
	1.008	23.08	4.25	7.98	17.7	0.136
	2.019	22.47	3.47	8.47	23.4	0.14
Nov. 24, 2015						
Station 1	0.177	12.36	2.87	8.18	18.4	0.089
	1.535	12.33	2.91	8.13	18.2	0.089
	2.584	12.31	3.06	8.43	19.1	0.089
Station 2	0.141	13.58	3.03	8.1	12.2	0.083
	0.974	13.49	2.6	7.98	13.2	0.083
	1.907	12.25	0.85	8.24	14	0.076
Station 3	0.597	12.68	2.85	7.83	18.3	0.082
	1.785	12.36	2.52	7.7	18.4	0.081
	3.047	12.13	1.98	8.02	17.8	0.079
Dec. 15, 2015						
Station 1	0.073	15.9	2.6	8.36	25.4	0.103
	0.963	15.74	2.59	8.35	27.1	0.102
	2.018	15.64	2.84	8.53	27.1	0.102
Station 2	0.026	17.19	2.89	7.84	9.7	0.092
	0.823	16.93	1.97	8.16	9.7	0.092
	1.433	16.21	1.33	8.33	9.6	0.093
Station 3	0.065	16.75	2.85	7.34	7.7	0.094
	1.278	16.23	2.49	7.47	7.8	0.093
	2.454	16.09	2.52	7.69	8.6	0.093

Table 12. Water quality sampling dates and water levels. Pool stage is 41.0 ft. (msl).

Date	Pool Stage
Jan. 11, 2016	42.5’
Feb. 18, 2015	41.5
Mar. 18, 2015	43.0
Apr. 15, 2015	42.3
May 20, 2015	42.0
June 16, 2015	42.0
July 15, 2015	41.3
Aug. 13, 2015	40.7
Sept. 16, 2015	40.5
Oct. 15, 2015	39.6
Nov. 24, 2015	43.0
Dec. 15, 2015	42.5

HABITAT EVALUATION

Aquatic Vegetation

Aquatic vegetation has historically restricted Spring Bayou boating and angler access. In 1994, hydrilla was discovered. The plant covered 75% of the surface area of Spring Bayou within two years. A 1996 fall drawdown was unsuccessful due to high water. A 1997 summer/fall drawdown provided limited control. Drawdowns recommended by LDWF after 1997 were not supported by the local public.

Contact and systemic herbicides (fluridone - Sonar®) have both been used in the past to combat the spread of hydrilla in Spring Bayou. Successive annual applications of systemic herbicides have reduced hydrilla growth in the treated areas. In October 2012, hydrilla covered approximately 2,000 acres throughout the complex. Water hyacinth, pennywort, primrose and alligator weed covered approximately 1,000 acres; common salvinia and American Lotus covered approximately 950 acres, and duckweed and frog's bit covered approximately 500 acres. Additionally, triploid grass carp have been stocked to reduce hydrilla infestations.

In August of 2013, a total of 19 acres of hydrilla was treated in Coulee Noir, Tee Lac and Lac a de Boutte to clear access lanes using an in-water treatment of the contact herbicide Aquathol K at a rate of 4 ppm. Upon investigation a month later, these lanes were opening up and allowing boating access. Also, 6 acres of hydrilla were treated at all four boat landings using the systemic herbicides Sonar PR & Q at a rate of 6 ppm. In October of 2013, hydrilla infestations were considerably reduced in these areas.

In May 2014, a total of 3 acres of hydrilla was treated at three boat landings using systemic herbicides Sonar PR & Q at a rate of 6 ppm. In the December 2014 survey, hydrilla infestations were very noticeably reduced in all areas of Spring Bayou – from 2,000 total acres in October 2012 down to 418 acres (15% total coverage) in the fall survey.

Plant coverage estimates as of December 2014:

- Hydrilla - 418 acres throughout the complex
- Water Hyacinth - 350 acres
- Pennywort - 50 acres
- Primrose - 100 acres
- Alligator Weed - 100 acres
- Common Salvinia - 200 acres
- American Lotus - 100 acres
- Duckweed - 50 acres
- Frog's bit - 100 acres

Plant growth projections for 2015:

Hydrilla - up to 400 acres (15%) scattered throughout the lake.
American Lotus – up to 250 acres widely scattered over the lake
Alligator Weed, Water Hyacinth & Pennywort - up to 400 acres mixed together and located primarily along the shoreline on lower end of lake.
Common Salvinia - up to 250 acres located primarily in the center of the lake.
Duckweed & Frog's Bit - up to 350 acres located primarily along shoreline on the upper end of the lake.
Coontail & Fanwort – up to 200 acres

Hydrilla coverage has decreased considerably due to grass carp stockings. As of December 2014, a total of 61,000 triploid grass carp had been stocked in Spring Bayou to reduce hydrilla infestations. Due to the reduction of hydrilla in Spring Bayou, as shown in the 2014 vegetative type map, a total of 4,180 TGC at 10 per vegetative acre (418 acres) are recommended for fall 2015. To reduce predation, stocked TGC will measure at least 12 inches in length. LDWF personnel will monitor aquatic vegetation coverage on an annual schedule. Sampling will also be conducted to monitor survival, growth, and effectiveness of stocked grass carp. Subsequent TGC stockings will be considered if necessary.

Plant coverage estimates as of November 2016:

Hydrilla - Zero
Water Hyacinth - 200 acres
Pennywort - 25 acres
Primrose - 50 acres
Alligator Weed - 60 acres
Common Salvinia - 75 acres
American Lotus - 75 acres
Duckweed - 50 acres
Frog's bit - 30 acres

Plant growth projections for 2017:

Hydrilla, Coontail & Fanwort – There is no submersed vegetation in the lake
Alligator weed, Water Hyacinth & Primrose - up to 300 acres mixed together and located primarily along shoreline on lower end of lake.
Common Salvinia - up to 100 acres located primarily in the center of the lake.
Duckweed & Frog's Bit - up to 100 acres located primarily along shoreline on the upper end of the lake.

Substrate

Excessive accretion has reduced the quality of nesting substrate in Spring Bayou. Accretion rate has increased markedly with the introduction of invasive aquatic vegetation.

CONDITION IMBALANCE / PROBLEM

1. The natural water fluctuation cycle of Spring Bayou (i.e., spring flood pulse and fall low water) was altered in 1955 with the construction of the spillway on the Little River.

2. Benefits of the natural water fluctuation cycle (i.e., increased sportfish nesting success and aquatic vegetation control) have been compromised.

3. Invasive species including hydrilla, common salvinia and water hyacinth have been introduced into Spring Bayou.

4. With limited natural control, aquatic vegetation coverage remains at levels considered to be harmful to sport fisheries and to angler access.

5. Lake drawdowns to mimic natural water level fluctuation are unpopular with users of Spring Bayou.

6. Physical limitations reduce water flow and increase time necessary to dewater the Spring Bayou system. Time necessary for drying substrate is limited to the degree that benefits are minimized.

CORRECTIVE ACTION NEEDED

1. Re-establishment and/or simulation of the natural water fluctuation cycle could provide substantial improvements to habitat, sportfish populations, and angler access.

2. Dredging is necessary to allow adequate water flow for water fluctuation. Areas that require dredging are Boggy Bayou and a portion of Little River.

3. Increased public information efforts are needed to explain the benefits of water fluctuation and the application necessary to achieve a healthy Spring Bayou.

4. All available control measures must be applied in an effort to control excessive aquatic vegetation in Spring Bayou.

RECOMMENDATIONS

1. An approach of integrated control measures (chemical, physical, and biological) is recommended to manage aquatic vegetation in Spring Bayou. The advantage of a combined approach is the ability to achieve benefits from several control methods and not be completely dependent on the success of any one approach.

2. Herbicide applications will continue to be conducted as per the standard operating procedure for the application of herbicides by LDWF aquatic plant control personnel.

3. LDWF personnel will monitor aquatic vegetation coverage on an annual schedule. Sampling will also be conducted to monitor survival, growth, and effectiveness of stocked grass carp. Subsequent TGC stockings will be conducted as necessary.

4. Dredge as necessary in Boggy Bayou and Little River to facilitate water flow and to increase effectiveness of fall drawdowns.

5. Water level fluctuation is an important tool for lake management. Drawdowns mimic natural low water periods of the fall and can provide many of the same benefits including aquatic vegetation control and fish population management. Cooler water temperatures in the fall also reduce the potential for fish kills. Consistent drawdown regimes will allow the introduced TGC to reduce hydrilla infestations. Therefore, if and when dredging is complete it is recommended that a drawdown of four feet below pool stage (37 msl) be conducted every 3 years, beginning the day after Labor Day. The target water level is to be maintained until the end of December, when the gates will be closed to allow the lake to refill. The lake will remain open for recreational activities during a drawdown.

6. Continued sampling will be conducted to monitor fisheries and aquatic vegetation status.

APPENDIX I:

§112. Prohibit the Use and Possession of Gill Nets and Trammel Nets; Prohibit the Taking of Grass Carp

A. No person shall use or possess any gill net or trammel net in the areas designated below as restricted areas. No person shall take or sell any fish taken with the prohibited gear. Additionally, no person shall take or possess any grass carp within the restricted areas.

1. Restricted areas:

a. Spring Bayou Wildlife Management Area (WMA), Avoyelles Parish;

b. Old River, Avoyelles Parish;

c. Little River, Avoyelles Parish.

B. Violation of the provisions of this Section constitutes a class two violation.

AUTHORITY NOTE: Promulgated in accordance with R.S.

56:21, R.S. 56:22.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 34:886 (May 2008).

Editor's Note: In §113. A.10,

APPENDIX II

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES
5652 HWY 182
OPELOUSAS. La. 70586

Commercial Fish Report

Name of Permit Holder: _____

Commercial Fish Lic. #: _____

Fish Report for Month of: _____

Date of Report: _____

	Grassy Lake WMA	Pomme De Terre WMA	Spring Bayou WMA
Special permit # for			
Number of days fished			
Catfish	Lbs.	Lbs.	Lbs.
Buffalo	Lbs.	Lbs.	Lbs.
Carp	Lbs.	Lbs.	Lbs.
Gar	Lbs.	Lbs.	Lbs.
Freshwater Drum (Goo)	Lbs.	Lbs.	Lbs.
Shad	Lbs.	Lbs.	Lbs.
Suckers	Lbs.	Lbs.	Lbs.
Turtles	Lbs.	Lbs.	Lbs.
Other	Lbs.	Lbs.	Lbs.
Totals	Lbs.	Lbs.	Lbs.